"To improve modeling, simulation and prediction of the tropical climate with coupled GCMs"

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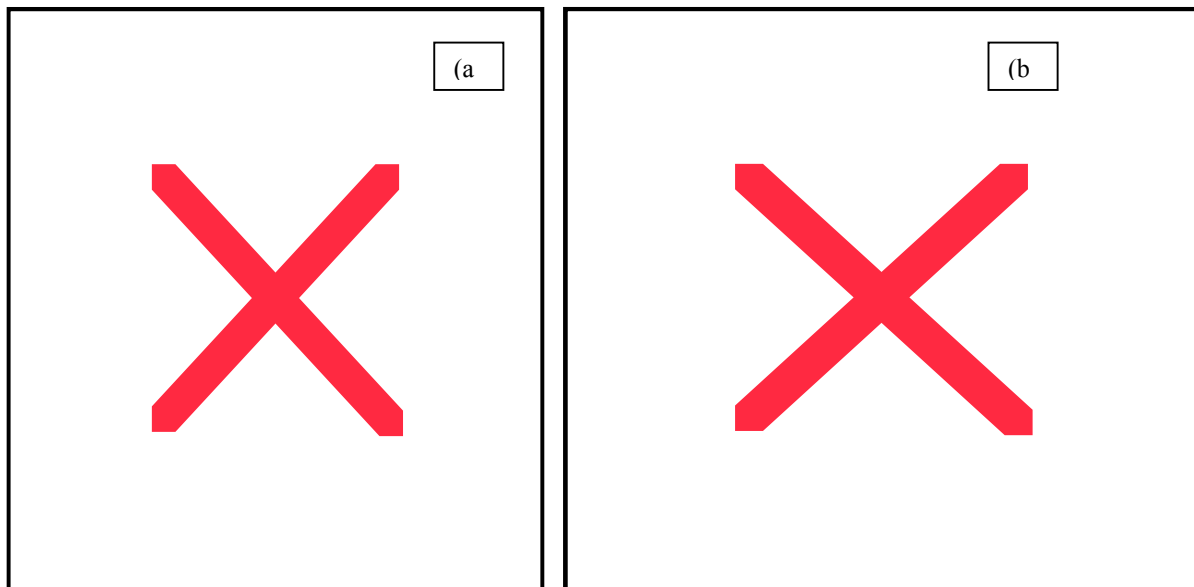
Figures:

Figure 1: Mean cloud cover in the southeastern Pacific in July 2008 in the GFS simulation with (a) the original shallow convection scheme; (b) the original shallow convection scheme modified to limit mixing across the trade wind inversion and eliminate vertical background diffusion above the inversion base. Both GFS simulations are uncoupled and forced with observed daily SST from July 2008.
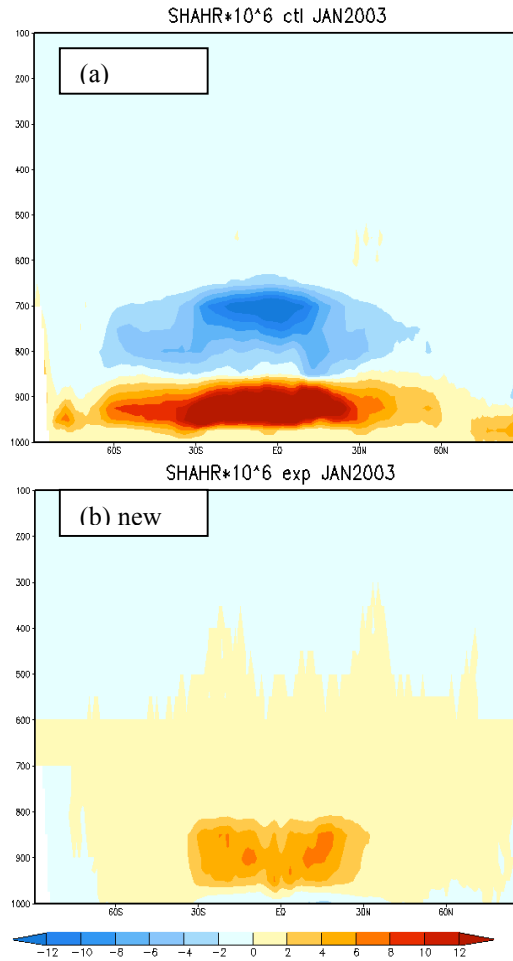
Figure 2: The January mean zonally average heating rate due to shallow convection in the GFS simulation with (a) the original shallow convection scheme; (b) the new shallow convection scheme.
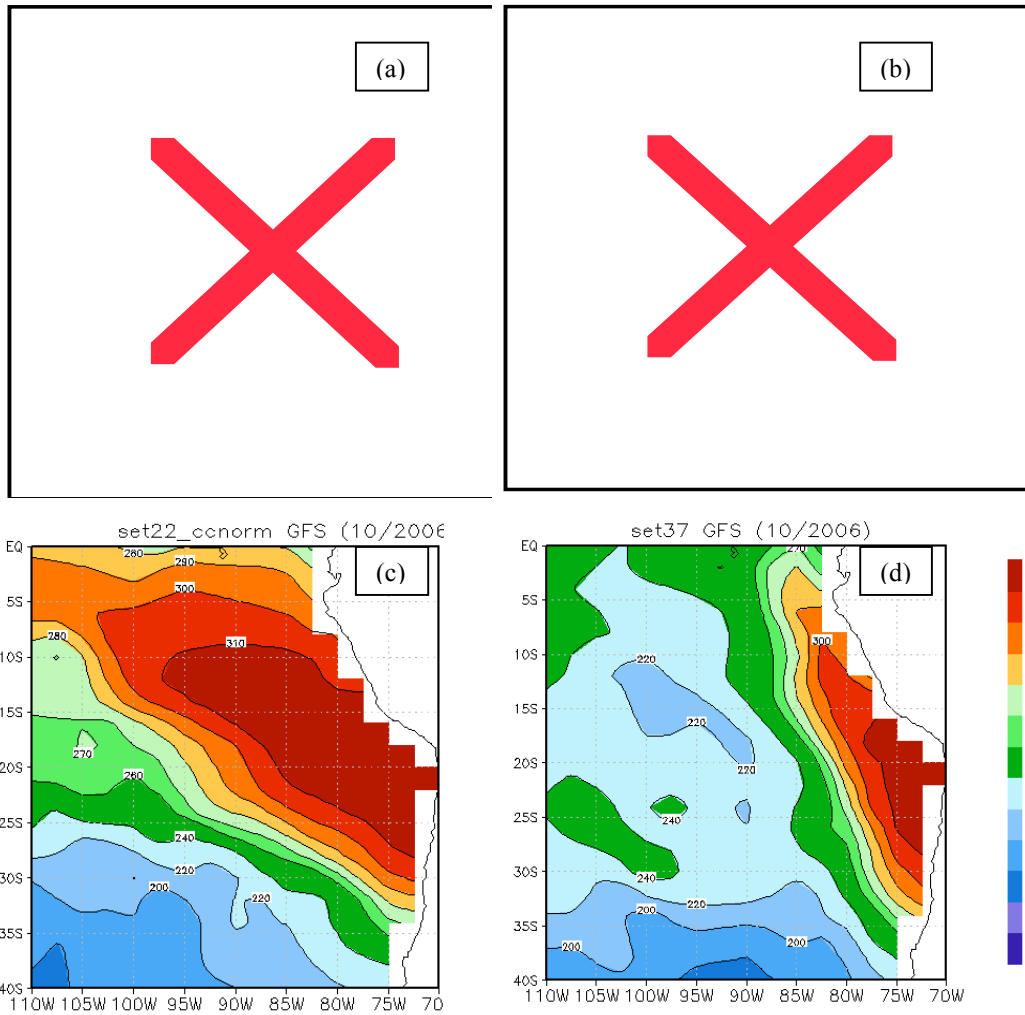
Figure 3: Mean total cloud cover (%) in the southeastern Pacific in October 2006 in the GFS simulation with (a) the original shallow convection and PBL scheme; (b) the new shallow convection and PBL scheme. Mean surface shortwave radiation (W/m^2) in the southeastern Pacific in October 2006 in the GFS simulation with (c) the original shallow convection and PBL scheme; (d) the new shallow convection and PBL scheme. Both GFS simulations used observed daily SSTs.
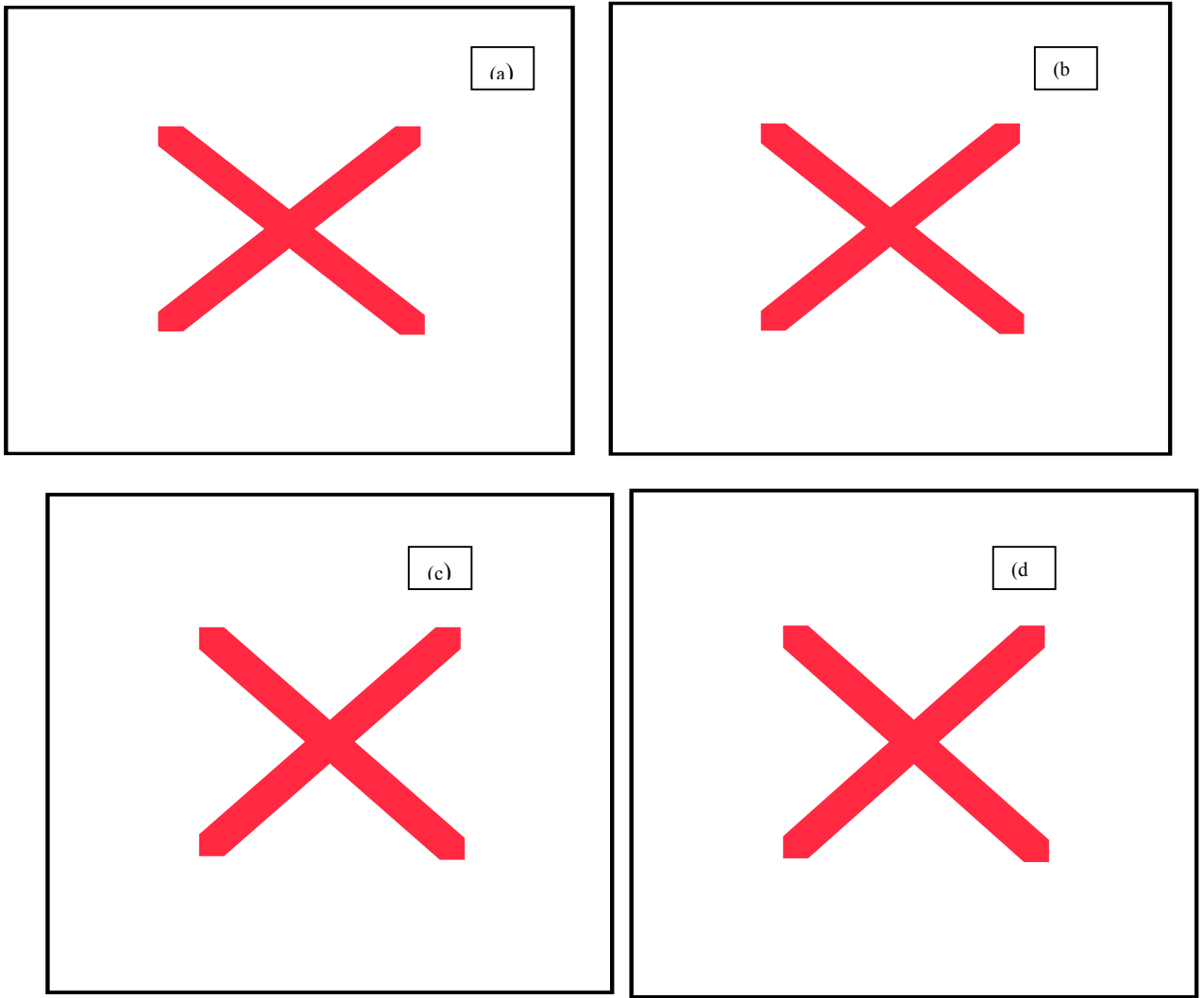
Figure 4: Mean cloud liquid water and ice content (g/kg) along 20°S in October 2006 in the CFS simulation with (a) the original shallow convection and PBL scheme; (b) the new shallow convection and PBL scheme. Mean SST errors in the southeastern Pacific in October 2006 in the CFS simulation with (c) the original shallow convection and PBL scheme; (d) the new shallow convection and PBL scheme. Both CFS simulations are initialized in August 2006 using reanalysis data from NCEP.